

Claims

What is claimed is:

1. An inside vehicle lift for transferring a load through a rear door opening of a vehicle comprising:

a load platform for receiving the load, the load platform being horizontally movable between a loading position with the load platform being disposed behind a rear bumper of the vehicle and a transport position inside the vehicle;

a base for being attached inside the vehicle to a vehicle floor such that a rear end of the base is located in proximity to the rear door opening;

a lift unit comprising a lift support base for supporting the load platform when disposed outside the vehicle, the lift support base being mechanically connected at a left hand side and at a right hand side to a left hand side lift actuator and a right hand side lift actuator, respectively, the lift actuators for vertically moving the lift support base with the load platform between a first vertical position with the load platform being in close proximity to ground and a second vertical position suitable for horizontally moving the load platform into the vehicle; and,

a left hand side gear mechanism in mechanical communication with a left hand side of the base and the left hand side lift actuator and a right hand side gear mechanism in mechanical communication with a right hand side of the base and the right hand side lift actuator, respectively, the left hand side gear mechanism and the right hand side gear mechanism for providing translational and rotational movement of the lift unit through the rear door opening of the vehicle between a first position inside the vehicle with the lift support base being disposed in proximity to the rear door opening and oriented substantially vertical and a second position outside the vehicle with the lift support base being disposed behind the rear bumper and oriented substantially horizontal.

2. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 1, comprising:

an extension unit being movably attached to the base for translational movement between a first position where the extension unit is completely inside the vehicle and a second position where a portion of the extension unit is moved through the rear door opening.

3. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 2, wherein the left hand side gear mechanism and the right hand side gear mechanism are connected to a left hand side and a right hand side of the extension unit, respectively, and wherein the left hand side gear mechanism and the right hand side gear mechanism are acting in response to the translational movement of the extension unit.
4. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 3, comprising a toothed gear drive for providing the translational movement of the extension unit.
5. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 4, wherein the toothed gear drive is driven by an electric motor powered by a battery of the vehicle.
6. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 1, comprising a drive mechanism for horizontally moving the load platform.
7. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 6, wherein the drive mechanism is driven by an electric motor powered by a battery of the vehicle.
8. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 7, wherein the drive mechanism comprises a chain drive interacting with a toothed rack.
9. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 8, wherein the drive mechanism comprises a friction drive.
10. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 1, wherein the load platform is supported by wheels and manually movable.

11. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 1, wherein each of the lift actuators comprises a hydraulic cylinders.

12. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 3, wherein the left hand side gear mechanism and the right hand side gear mechanism each comprise:

a first lever pivotally connected to the base;

a second lever pivotally connected to the first lever and pivotally connected to a lever support mounted to the extension unit, the second lever for pivotally moving the first lever in dependence upon translational movement of the extension unit;

a third lever pivotally connected to the lever support and pivotally connected to a bottom portion of the lift actuator for providing substantially translational movement to the lift actuator; and,

a fourth lever pivotally connected to the first lever and pivotally connected to a top portion of the lift actuator for providing substantially rotational movement to the lift actuator.

13. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 12, wherein the lift actuator comprises a lift actuator support for being in mechanical contact with the extension unit for providing vertical support to the lift unit when disposed outside the vehicle for loading.

14. An inside vehicle lift for transferring a load through a rear door opening of a vehicle as defined in claim 12, wherein the lift support base being disposed in proximity to an upper inclined portion of the rear door opening and oriented substantially parallel thereto.

15. A method for transferring a load through a rear door opening of a vehicle comprising:

disposing a load platform supported by a lift support base behind a rear bumper of the vehicle with the load platform being in close proximity to ground, the lift support base being mechanically connected at a left hand side and at a right hand side to a left hand side lift actuator and a right hand side lift actuator, respectively, the left hand side and the right hand side lift

actuator being in mechanical communication with a left hand side and a right hand side of a base via a left hand side gear mechanism and a right hand side gear mechanism, respectively, the base being attached inside the vehicle to a vehicle floor such that a rear end of the base is located in proximity to the rear door opening;

disposing the load on the load platform;

using the left hand side and the right hand side lift actuator lifting the lift support base with the load platform to a vertical position suitable for horizontally moving the load platform into the vehicle;

translationally moving the load platform with the load through the rear door opening from the lift support base into the vehicle; and,

translationally and rotationally moving the lift support base and the lift actuators through the rear door opening to a position inside the vehicle where the lift unit is disposed in proximity to the rear door opening and oriented substantially vertical.

16. A method for transferring a load through a rear door opening of a vehicle as defined in claim 15, wherein the left hand side gear mechanism and the right hand side gear mechanism is connected to a left hand side and a right hand side of an extension unit, respectively, the extension unit being horizontally movable with respect to the base.

17. A method for transferring a load through a rear door opening of a vehicle as defined in claim 16, comprising translationally moving the extension unit into the vehicle such that the complete extension unit is disposed within the vehicle.

18. A method for transferring a load through a rear door opening of a vehicle as defined in claim 17, wherein the load platform is moved onto the extension unit.

19. A method for transferring a load through a rear door opening of a vehicle as defined in claim 18, wherein the lift support base is moved such that the lift support base is disposed in proximity to an inclined upper portion of the rear door opening and oriented substantially parallel thereto.